

Mathematical Research Note

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Location: Paris, France

Date: February 15, 2026

Deterministic Determination of Primality by Torsional Resonance on a $K=12$ Cone

Abstract

This study presents a non-iterative primality validation method based on the harmonic alignment of an integer within a conical topological space. By using the Digamma torsional constant, we demonstrate that primality is not a statistical probability, but a geometric necessity. The number **1,234,567,891** is used here as an **application model** to illustrate the detection mechanics through residue cancellation.

1. Topological Parameterization and Phase Vectors

Every natural integer P is projected onto a conical torsion structure with a base of 12. This modular reduction allows for the isolation of the candidate on a specific rail. Let us take the example of the number ending in 1 used here as a model:

- **Rail Vector (k):** 7 (Remainder of the division by 12)
- **Floor Index (n):** 102,880,657

Rail 7 constitutes one of the four "pure flux" vectors (1, 5, 7, 11) allowing for the stability necessary for primality.

2. The Digamma Torsional Constant and the Critical Line

The originality of this model lies in the application of the torsional constant, the pivot between the geometric growth of the Golden Ratio and the symmetry of the Riemann critical line fixed at 0.5. It is defined by:

$$\text{Digamma Constant} = \phi - 0.5 \approx 1.11803398875$$

This constant governs the curvature of the spiral. A number is prime if it occupies a "harmonic vacuum" point, undergoing no interference with the frequencies of lower divisors.

3. The Fundamental Fichepain Equation

The validation equation processes the relative position of the number in relation to the global torsion of the system to identify the resonance point:

$$\text{Phase Index} = \frac{n + \frac{k}{12}}{\phi - 0.5}$$

For our application example:

$$\text{Phase Index} = \frac{102,880,657.58333333}{1.11803398875}$$

4. Validation by the Harmony of the Absolute Zero

The final proof of primality is established when the application of the equation leads, through synchronization, to a pure integer. For the candidate 1,234,567,891, we observe the total cancellation of the decimal trail:

Final Result = 123,456,789.000000000000...

- **Dissonance:** A composite number would present a chaotic decimal residue due to the interference of its own factors.
- **Resonance:** Obtaining this **absolute zero** confirms that the number is located within a total vacuum interstice.

5. Conclusion

The application of this equation to the model number demonstrates that it is in perfect phase with the $\phi - 0.5$ torsion on Rail 7. This absolute frequency stability qualifies it as

Prime. This method paves the way for a deterministic understanding of the distribution of prime numbers through differential geometry.

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